## ABSTRACT

The present invention is to a safe, biodegradable trace metal binding system that effectively delivers chromium, cobalt, copper, iron, manganese, molybdenum, selenium and zinc to animals. The method of preparing an animal foodstuff composition involves the steps of: providing transgenic algal cells comprising a nucleotide sequence, the nucleotide sequence being capable of expressing a non-native metal-binding protein in the transgenic algal cells; binding the metal-binding protein with at least one metal so as to produce a metal-bound adduct of the metal-binding protein; and admixing the metal-bound adduct with animal foodstuff. The invention is also to a animal foodstuff composition comprising animal foodstuff and transgenic algal cells expressing a non-native metal-binding protein in the transgenic algal cells, such that the transgenic algal cells contain the metal-binding protein and the metal-binding protein being bound to a metal.